

Reviews

Pollution as a Tort: A Non-Accidental Perspective on Calabresi's *Costs*

Frank I. Michelman†

The Costs of Accidents: A Legal and Economic Analysis. By Guido Calabresi. New Haven: Yale University Press, 1970. Pp. x, 340. \$10.00 (clothbound), \$3.75 (paperback).

I.

The Costs of Accidents has a somewhat misleading title.¹ There are no data here to interest the National Safety Council or Nader's Raiders. In fact, there are no data at all, and thereby hangs one of the interesting questions about this book.

Calabresi's stated object is to lay a "theoretical foundation for accident law,"² by explicitly employing a body of conceptual and analytical material drawn from the province of economics. Indeed, the book may to law-trained readers seem more a treatise on economics than a "law" book. Yet its particular ways of focusing, refining, and expressing³ economic material clearly reflect a lawyer-like earthiness, compulsion to detail, and concern for institutional function.

Others must say whether *The Costs of Accidents* will be interesting to economists. It would not surprise me to learn—though I am breath-takingly unqualified to say—that Calabresi is operating well within the frontiers of economic theory. It would, however, surprise me greatly to be told that he sheds no new light on ground already worked over. My guess is that, by training theory on a problem—that of accidents—which I believe has not been prominent in economic discussion, Calabresi will have done enough in the way of reformulating concepts, revealing unsuspected relationships among them, and pressing certain arguments

† Professor of Law, Harvard University.

1. Not to mention the dust-jacket, which appears to be a non-representational depiction of a heroic smash-up. Something evoking Ariadne and the Labyrinth would have been more fitting.

2. See G. CALABRESI, *THE COSTS OF ACCIDENTS: A LEGAL AND ECONOMIC ANALYSIS* 1, 7-10 (1970) [hereinafter cited to page number only].

3. Calabresi sticks to discourse. The customary graphic and algebraic accoutrements of economics literature are foregone.

to high degrees of detail and refinement, to make his efforts worthy of an economist's time.

But Calabresi's chief object has not been to expound or advance economic theory. Rather, it has been to provide a conceptual apparatus for describing, comprehending, and evaluating systems of accident law; and it is with respect to that (obviously worthy) object that his book should be evaluated. It is important to understand that Calabresi's own contribution to "a theory of accident law" lies not in posing empirically testable hypotheses, or in analyzing with detailed data the relative merits of competing proposals for accident law reform. The value of his conceptual apparatus, Calabresi suggests, is "to indicate the questions we must ask in deciding whether one system [of accident law] is preferable to another."⁴ Put another way, Calabresi's concepts direct our attention to the implicit questions and answers—the assumptions—concerning human behavior, economic impact, and political values which are embedded in proposals for accident law reform. As Calabresi notes, some of these questions are "essentially empirical"⁵—that is, their answers require the gathering and analysis of data—and others seem to be largely "political," in the broad sense of turning on some group decision about competing values. The goal of Calabresi's conceptual apparatus is to articulate these questions with some precision, and to provide some overarching concepts with which to compare different proposals and structure future research.

In assessing Calabresi's efforts toward this goal, it will be necessary to begin with some recapitulation of the book's contents. I confess this is a task which fills me with despair. Calabresi's book is a nigh-inexhaustible (though sometimes exhausting) trove of arguments, rejoinders, perspectives, considerations, and satellite topics—all of which, one feels certain, must themselves already have been mercilessly distilled by the author out of an even more fulsome vat of seething thought. I shall be satisfied if, in sketching out a few of the main lines of argument, I can convey some feeling not only for the book's inimitable style but also for the causes thereof. Calabresi has given us an amazing concoction of cragginess and grace, of homely example and mindcracking neologism, of lucidity and abstrusity, of steadfast focus and spiralling digression; but the subject seems highly resistant to linear and transparent exposition, and I am convinced that Calabresi has done well to domesticate it as effectively as he has.

4. P. 313.

5. *Id.*

After presenting the outlines of Calabresi's conceptual apparatus and indicating the kinds of applications he has in mind for it, I shall undertake some interpretation and criticism of the key distinction used by Calabresi in organizing his book—that between “general deterrence” and “specific deterrence”—and suggest that there may be a more enlightening way of formulating the thought than the one Calabresi has used. I shall then set his concepts to work on some issues presently receiving a good deal of discussion in the field of air-pollution control, as a way of further understanding and testing the power of Calabresi's theoretical framework to guide and clarify thought about the economic implications of legal regulation.

II.

A. *Goals, False and True*

Calabresi opens his discussion by warning against some “myths” whose prevalence, he says, encumbers thought about accident-cost problems. The first myth is that it is (or ought to be) our aim to avoid accidents at all costs. On the contrary, says Calabresi, “[o]ur society is not committed to preserving life at any cost.”⁶ Rather, it often appears to trade off accident costs against those of curbing accident-prone activities. We could avoid spending human lives and limbs on the building of tunnels, if we were ready to pay the extra costs of getting by Mont Blanc. The second (and converse) myth which Calabresi warns against is that “economic laws give absolute answers”⁷—the proposition that if an activity meets the test of the market after paying all the accident costs assessed to it (through private contract and tort law), it has thereby established its right to be let alone. In response, Calabresi points out that not all the negative judgments which society might reasonably make about an accident-causing activity can be expected to materialize in market transactions. Some of the judgments might contain “moral” elements and so defy accurate market valuation (consider, for example, the case of automobile speeders, or environmental damage from an oil spill). Others might be monetizable in principle, but for practical reasons be impossible to channel through the market (consider, *e.g.*, the costs of treating chronic ailments caused or aggravated by pollution of the air). These points may seem so obvious as not to require militant restatement. Those who think so are too complacent; even learned

6. P. 17.

7. P. 18.

persons who start by pledging allegiance to these axioms are sometimes prone to betray them in the heat of battle.⁸

Another "myth" is that "a necessary financial link exists between injurers and victims."⁹ There may be a natural tendency for people to think about the problem as if accident costs must either be left on victims or, if shifted at all, shifted to the "injurers" whose activities seem to have caused the accident. But, as various social-insurance schemes illustrate, our choices are not really so limited.

Calabresi analyzes accident costs into three sub-categories, which he seems to distinguish according to what can be done to reduce the costs in each. "Primary costs" are those which most of us would tend to think of as accident costs proper—the costs which can be reduced only by terminating or altering one or more of the various activities whose interaction culminates in the costly event called an accident. It is these costs which can only be optimized, but never eliminated, because termination or alteration of the accident-generating activities is itself costly. "Secondary costs" are those, generally materializing as economic dislocation or aggravation of injury, which can be reduced even after the costly interaction of "primary" activities has already come to pass, simply by "spreading" the costs over time or among persons rather than leaving them immediately and heavily concentrated on one or a few persons.¹⁰ Calabresi is at pains to show that these costs may be quite real and quite avoidable, and that the issue is not merely one of shifting them about from one time or person to another. A failure to spread may result in a failure to provide timely medical treatment which can shore up the victim's long-term health prospects. A bit more subtly, a failure to spread may force a quantum change in the victim's "class" or "life-style"—itself detrimental to welfare—which spreading could have averted. Unlike primary costs, secondary costs could apparently be reduced to near zero by adequate spreading. Finally, there are "tertiary

8. Compare Posner, Book Review, 37 U. CHI. L. REV. 636, 638 (1970), with *id.* at 615. See also J. ESPOSITO, VANISHING AIR 306 (1970), recommending that pollution "ought to be stopped whenever and wherever possible," and calling for "[l]egislation . . . founded on the principle of reducing atmospheric contamination to the greatest extent technologically possible." Esposito's view seems to proceed not blindly from the first myth (which it superficially resembles) but from a more sophisticated and deliberate choice influenced strongly by special sensitivity to the hazards of suspected but yet-uncomprehended biological harm. See *id.* at 307.

9. P. 22.

10. Calabresi does not include among secondary costs any resentment or demoralization which might flow from a failure to compensate. See Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law*, 80 HARV. L. REV. 1165, 1214 (1967). Insofar as he would take note of such effects at all, it would be through the "justice" constraint against which he would test any system of accident law.

costs"—the "friction" or "transaction" costs of operating whatever administrative or market machinery we utilize for the control of primary and secondary costs. Tertiary costs, too, could in theory be reduced to zero if agreement could be reached simply to leave all accident costs on victims as and when they accrue.

In offering his three-fold analysis of accident costs, Calabresi is of course not merely engaging in classification for the fun of it. The classification is a prelude to the argument—sustained, really, throughout the book—that the search for an ideal system of accident-cost control must partake heavily of a "systems" approach, because it is very likely that any method which can drastically reduce one category of costs will interfere significantly with control of costs in another category.

Thus, there are two quite distinct senses in which secondary costs may be called a problem. First and most simply, they are a problem insofar as they exist and could be reduced. Giving this meaning to "the problem of secondary costs," it is no doubt reasonable to suggest that the problem might be "adequately taken care of by the availability of medical, life, and disability insurance, in which event we could largely forget about that problem and concentrate on primary accident costs."¹¹ But, as Calabresi is at great and repeated pains to remind us, secondary costs are also a "problem" in the sense that the spreading devices used to control them tend to interfere (through what Calabresi calls "externalization by transfer") with deterrence arrangements useful for the control of primary costs. For example, we might choose to rely on "medical, life, and disability insurance" to solve the problem of secondary costs on, say, drivers who get hurt in two-car accidents. But such reliance would prevent us from seeking primary accident-cost reduction through the deterrence which might flow from requiring drivers to shoulder the costs of accidents which they are deemed to cause. In this latter sense, the problem of secondary costs is always with us because it is inextricably intertwined with the ineradicable problem of primary costs.

From what has been said, the reader can easily deduce how Calabresi formulates the over-all objective of an ideal system of accident law; the goal is to minimize the sum of primary, secondary, and tertiary costs (including within primary costs any benefits forgone for the sake of avoiding accidents). To this it is necessary to add that we are to seek this optimum while avoiding injustice. "Justice" is thus explicitly relegated to a background role, entering into the *schema* as a constraint rather than as a goal.

11. Posner, *supra* note 8, at 638-39.

It is not only a rather passive, but also a rather specialized view of justice we encounter here. The constraint, as discussed by Calabresi, has two important focuses: equity as between the parties to an accident, injurer and victim; and consistency as among all injurers, or all victims, who appear to be similarly circumstanced. Calabresi's concentration on these aspects of justice may stem from his focus on the accident problem, and particularly on the "fault" system of allocating accident costs—a system which is often defended because of its alleged capacity to work justice as between the injurer and victim in any given accident, and just as often attacked because of the asserted irrelevance (from the point of view of victims) of its criteria for selecting which out of all accident victims to compensate.

B. *Deterrence, General and Specific*

The major portion of Calabresi's book is devoted to consideration of primary-cost control. Two basic methods are identified, and respectively labelled "general" (or "market") deterrence and "specific" (or "collective") deterrence. For now, let us say that the distinction between them is that under general deterrence, assignments of worth to accident-causing activities—and therefore decisions about how far to go in diminishing or altering such activities for the sake of accident costs thereby saved—are left to the market; while under specific deterrence the comparative evaluation of an activity and its accident costs, and the related decision about how far the activity should be restricted or modified, are collectively made.

General deterrence is exemplified by a rule holding manufacturers strictly liable¹² for injury caused by their machinery. Such a rule exerts deterrent pressure against more-or-less accident-prone manufacturers of, say, snowmobiles by inducing them to account in their net-profit calculations for the costs of damage judgments associated with their unmodified production activities; and to trade off the gross costs of various ways of making the product safer against the resultant savings in accident-cost liabilities, in a search for the optimum procedure. If even that turns out to involve a below-market rate of return for the industry's ablest competitors, manufacture of the product (which is now shown to cause more accident costs than it is otherwise worth in the market) presumably will cease.¹³ The essential point, as regards the

12. Throughout this review, I shall use the phrases "strictly liable" and "strict liability" to refer to imposition of liability without regard to fault, and also without regard to abnormality or defect.

13. Or, less extremely, prices will rise and total demand (and output) will fall.

distinction between general and specific deterrence, is that the decision about whether production justifies itself in view of accident costs—or the search for means by which production can be beneficially altered so that it will justify itself in view of these costs—is left (through the manufacturer's profit-seeking) to the market.

Specific deterrence is exemplified by a penal law prohibiting the sale or use of snowmobiles in heavily populated areas. The law, we may assume, is largely motivated by the accident-proneness of snowmobiles in such settings. In case of doubt about whether that accident-proneness, when added to the other costs of producing snowmobiles, actually overbalances the recreational and other benefits derived from snowmobiling, a market test might be arranged through strict manufacturers' or sellers' liability. The indulgence in a collective prohibition might, therefore, seem to indicate unusual certitude about how the economic balance tilts—so as to make the market test itself seem unnecessarily costly. Calabresi recognizes that such certitude may explain some uses of specific deterrence; but he seems more interested in other cases which are to be explained by societal insistence on injecting non-monetizable, non-transactionalizable factors—"moral" factors, in short—into the equation. Thus the anti-snowmobile law may result from (a) a collective devaluation of recreational benefits reflecting an anti-snowmobile, conservationist sentiment in the community, and (b) a comparison of this adjusted value with accident and other production costs. In either case, the essential point is that society has not scrupled to dictate its own, collective findings—implicitly as to the terms on either side of the equation and explicitly as to the ultimate solution.

1. *General Deterrence and Collective Decisions*

Now for a closer look at general deterrence. Returning to our example of strict manufacturers' liability, it is to be noted that for all its intent to throw "the decision for [or against] accidents"¹⁴ back onto the market, a strict-liability rule still entails significant collective intervention in the process at two critical points. Society through its legislative or judicial organs is of course the author of the very decision (through strict liability) to assign accident costs to manufacturers rather than victims; and society through its courts evaluates the costs of all accidents (directly through litigation of those which do not lead to voluntary settlement, and indirectly, through the background threat

14. See Calabresi, *The Decision for Accidents: An Approach to Nonfault Allocation of Costs*, 78 HARV. L. REV. 713 (1965).

of litigation, where cases are settled). These two collective decisions exemplify two general questions respectively called by Calabresi "what-is-a-cost-of-what" and "what-is-the-cost."¹⁵ A central proposition of his theory is that collective decision of these two questions is inescapable in any system of primary accident-cost control, no matter how closely it seeks to be tied to the market.

a. *Assignment of Liability—Cheapest Cost Avoiders and Externalization*

What-is-a-cost-of-what is the decision about which activity, of the two or more whose convergence results in given accident costs, should be said to have "caused" (or, in the Calabresian usage, should be "held liable" for) those costs. To say that law is in any sense deployed for purposes of controlling primary accident costs is precisely to say that what-is-a-cost-of-what is being decided collectively. There is no escape, because leaving costs on victims is itself a choice. This choice may be adopted because it is thought optimal for primary-cost control—because, for example, rotary-mower dismemberments are thought best controlled by pressuring users to wear protective shoes—but that is to say that a collective decision has been made about whether liability for such accidents is better assigned to manufacture and/or sale of mowers or, alternatively, to ill-shod use of them.

Since, then (contrary to still another "myth"),¹⁶ the idea of strict manufacturer's (or "enterprise") liability provides no sure guide to how liability ought to be allocated for general-deterrence purposes, what is the principle which ought to be followed? In developing his own conclusion—that rules should be set so that liability will come to rest on "the cheapest cost-avoider"—Calabresi draws heavily on a seminal article by economist Ronald Coase.¹⁷ The starting point is that in a world where voluntary transactions could be arranged costlessly, primary-cost optimization would result irrespective of the initial placement of liability and we could therefore (except for possible concern about secondary costs or justice) leave it on victims. Thus, suppose it to be clear that the cheapest means to significant reduction of rotary-mower accidents are those, such as altered design, lying within the control of manufacturers. Manufacturers would, then, by definition be the "cheapest cost-avoiders." But no collective shift of liability to manu-

15. In this review I shall often refer to them, respectively, as "the liability question" and "the cost-valuation question."

16. I.e., that "risk distribution is self-explanatory." See p. 20.

17. Coase, *The Problem of Social Cost*, 3 J. LAW & ECON. 1 (1960).

facturers would be required because, by our hypothesis that product alteration is a cheaper method of accident-cost avoidance than protective clothing or reduced use of mowers, the victims on whom accident costs initially fall would find it worth their while to compensate ("bribe") manufacturers for the cost of altering the product—if, but only if, that cost were less than the costs of accidental injuries thereby avoided. The market would, indeed, function just as efficaciously if we decided that mower-accident costs should be placed initially on rock musicians. Holding our other assumptions constant, we can assume that the musicians would in due course figure out that (a) there is nothing much they can do directly about the problem (*they* are not the cheapest cost-avoiders) (Calabresi calls this step an "initial rough guess"); (b) a dollar spent compensating manufacturers for altering the product saves more accident costs than one spent compensating users for wearing protective clothing or giving up mowing; and (c) dollars spent thus compensating manufacturers are (or are not) worth their savings in accident-cost liabilities. Depending on which conclusion is reached on item (c), manufacturers will (or will not) be bribed by musicians to alter the product—which is the efficient solution.

It should be obvious that the reason for not taking such a complacent view of the market's ability to optimize is the falsity of our starting assumption that transactions are costless. If we know for sure that manufacturers are the cheapest cost-avoiders, there is no reason for incurring the tertiary costs of transactions required before a liability placed initially on mower-users or rock musicians will come to rest on manufacturers, where it "belongs." Indeed, by not placing the liability directly on manufacturers, we run the risk that the efficient solution will be lost because the transaction costs of shifting liabilities become so large for, say, rock musicians, that it is cheaper all told for them just to pay the accident bills.

Unfortunately, it is not always quite obvious who the cheapest cost avoider is. What should we do if in doubt as between rotary-mower manufacturers and users? Calabresi offers a number of "guidelines" for handling this problem. An important one is to avoid "externalization."¹⁸ In our mower case we might note that if mower-accident costs are placed on users, users—responding to the marketing practices of the insurance industry—may tend to classify these costs among the general risks of personal injury associated with being alive and active, and so leave them to be taken care of by general accident and health insur-

18. See p. 144.

ance. The costs of such insurance do not reflect specifically the frequency or severity of mower accidents, and so exert no particular pressure towards behavior modifications (like heavy shoes or reduced mower consumption) specifically adapted to mower accident cost reduction. For any user who carries accident and health insurance anyway, the question of investing in mower-proof shoes depends how their costs compare with the risks to him of mower-accident costs, considering that the insurance benefits will be available. In short, some of the desired accident-cost pressure has been allowed to escape from decision-making about mower use (been "externalized") and thereby deprived of its deterrent effect. Any likelihood that this will happen, Calabresi suggests, would argue for initial placement of liability on manufacturers because they seem very likely to be, among imaginable cost avoiders, the "cheapest" who are reasonably susceptible of being deterred by market pressures.

b. *Assignment of Liability—The Need for Prospective Rules*

The inescapable collective decision of what-is-a-cost-of-what may, as Calabresi shows, be made on a highly individual basis with reference to each costly incident as it arises, or on a less individualized basis with reference to classes of incidents resulting from similar interactions of general categories of activity. The difference can be illustrated through Calabresi's argument that the latter sort of decision-making is to be preferred for general deterrence in the accident field. His basic point seems to be that the proper cost pressures cannot adequately be brought to bear on accident-prone activities by leaving it to individual actors to extrapolate from a series of retrospective liability-placing decisions the statistical cost which is thereby being loaded onto "their" activities. Not enough information is conveyed (at the stage where decisions "for accidents" or against them must be made) by a rule placing liability on that activity retrospectively judged to be the cheapest cost-avoider in the particular case. Prospective (*i.e.*, categorical) rules are necessary for this purpose, probably couched in terms of fairly broad classes of activity (driving, driving while intoxicated, selling cars, walking on the streets at dusk), and in terms of classes of accidents involving pairs of these activity classes ("Cars are liable for costs of collisions between cars and bicycles.") Stated another way, in order to exert effective deterrent pressures liability rules must define insurable classes of activity; and a class such as "activity which, in a given case, is retrospectively determined to have been the cheapest cost-avoider" obviously will not do. Having gotten this far, it is easy for Calabresi to go on and show that categor-

ization will in any event occur (through private insurance) despite insistence by the official system on case-by-case identification of the cheapest cost-avoider—so that the official case-by-case determination involves wasteful tertiary expenditure, unless we (absurdly) prohibit insurance and rely (stupidly) on extrapolation of costs by individual actors.¹⁹

c. Valuation of Costs

Let us now turn to the what-is-the-cost question. Calabresi argues that this one, too, must be decided collectively in any system of primary accident-cost control (except, of course, insofar as liability is left on the victim). His claim seems persuasive. Suppose first that decisions about who is liable are to be made on a case-by-case basis—which is to say retrospectively—for each accident. In that case, decisions about what-is-the-cost could hardly be left to the market, by having the victim bargain with any injurer who is being held liable for the accident. The parties at this point can bargain (“settle”) only in the limited sense of trying to predict how the costs would be collectively valued in litigation. Neither has anything to concede except his prediction that a collective judgment of the accident costs will be higher (or lower) than his adversary claims; and neither has anything to trade for the other’s concession except the prospect of saving litigation costs. Bargaining so constricted is but an appendage of collective evaluation; it is not a discrete process of market evaluation.

Suppose, alternatively, that the liability question is to be decided by prospective assignment of the costs of defined classes of accidents to defined classes of activity—for example, by a rule that mower manufacturers are strictly liable for all mowing injuries, or that drivers are liable in all car-pedestrian collisions. There is some reason to believe that in the mower case the what-is-the-cost question *can* now be left to

19. Another flaw found by Calabresi in case-by-case determination is that in focusing on what went wrong in the particular case, the system may ignore that insurable category of activity which is, of all such categories involved in the accident under consideration, the cheapest cost avoider. Case-by-case decision, “because it centers on the possible *particular* cost avoider” such as absent-mindedness, drunken, or drowsy driving, “is very likely to ignore the recurring cost avoider and hence fail altogether to consider some potential cheapest cost avoiders such as highway builders or tire-makers.” (P. 256). It is not an adequate response that under a “fault” system an injurer can escape liability by showing that “not it but a stranger to the proceeding—the manufacturer of the automobile, the contractor who built the roadway . . . —was the one ‘at fault’ . . .” (Posner, *supra* note 8, at 645.) Insofar as this is so, it may compound rather than cure the defect, for the result of allowing this defense may be not to shift the cost to the putative cheapest cost avoider, but to “externalize” it by leaving it on a victim who may well represent that activity which is the least capable cost avoider of all those involved.

market determination. Manufacturers can offer mowers at reduced prices in exchange for the purchaser's waiver of accident liability claims—so that the difference in market prices of mowers sold subject to waiver and those sold "straight" would represent a true market evaluation of mower accident costs.²⁰ Calabresi does not argue that this is impossible, but only that it is undesirable given severe limitations on consumer information and self-discipline.²¹ In the auto-driver case, though, it is literally impossible to construct such a market in accidental injuries. There is no transaction, prior to the accident itself, to link the injurers with their potential victims; and no way, therefore, for drivers to purchase advance releases from the liabilities to which they are exposed. Insurers can know the accident costs of driving only by extrapolation from a series of collective what-is-the-cost decisions, no one of which can be made until after occurrence of the accident to which it relates. In sum, it seems impossible in the auto-accident field to create a pure system of market deterrence. Whenever a deliberate shift of liability is instigated for deterrent purposes, collective cost evaluation must to some extent be substituted for that of affected individuals. But leaving all costs on victims—which would assure their receiving a highly individualized evaluation—would also surely result in a great deal of externalization (that is, of cost-bearing by those who are very poor cost-avoiders).

III.

The ideas and arguments so far summarized occupy substantial portions of Calabresi's book—the least difficult and, I would guess, the least original portions. They fairly represent the book's intellectual concerns, style and approach, but not its subtlety and complexity. Calabresi is not so susceptible to summary restatement when he digs into such matters as the possible reasons for preferring specific to general deterrence; or the implications of using variants of specific deterrence such as taxation or licensing in order to limit the total amount of an accident-prone activity (but not restrict it absolutely), or of imposing sanctions for violation of a specific-deterrence rule only when an accident results; or when he analyzes special externalization problems which arise in con-

20. Note that if heavy shoes are a cheaper cost-avoidance method than product alteration or reduced mower use, buyers can choose the "waiver" price and buy shoes with a part of their savings; and that, once an equilibrium is reached, the waiver savings should not exceed the price of protective shoes.

21. See pp. 55-58.

nection with "pain and suffering," or in trying to define neither too narrowly nor too broadly a specifically restricted category of activity; or the various ways in which specific and general deterrence will interact as to any activity whether we like it or not, and how we might go about deliberately turning such interactions to our advantage.

What finally results is not a blueprint for an ideal system of accident law, nor even a computer program which will cough up a blueprint as soon as we provide the data or the guesses for assigning values to all the parameters. We get, rather, an apparatus for assisting both creative and critical thought about the design of accident-law systems. Once we are able to define a problem in manageable terms and proportions, Calabresi's apparatus enables us to think and speak clearly about such matters as general-deterrence approaches which might be available at reasonable sacrifice in secondary and tertiary costs; the alternative specific deterrence approaches available; and how we can select one approach to lean on most heavily while using others for backup purposes.

To get a flavor of the kind of "application" Calabresi himself seems to contemplate for his work, consider some of his offerings²² on the question of "first-party" versus "third-party" auto liability schemes—a matter which attracts his attention at several points in the book.²³ Although much of the current argument about this question seems to rage about issues of tertiary costs and justice, Calabresi asks us to observe also the possibility of a significant primary-cost issue. Insurers, he suggests, might be expected to respond to first-party liability by setting up rate categories which favor heavy, armor-plated cars that effectively protect their occupants though they may be especially devastating to what they hit. If our collective judgment is that increasing the proportion of smaller and lighter cars would tend to reduce primary accident costs, we can use specific deterrence (*e.g.*, an excise tax on automobile weight)²⁴ to counteract any insurer preference for tanks. But our very consideration of such action should make us reconsider whether first-party insurance is really what we want, or whether there is not some

22. Actually, this is my blending of observations offered by Calabresi at scattered places in his book.

23. A third-party scheme is one, such as the prevalent "fault" system, in which a driver or auto owner is exposed to (and insures against) the risk of being held liable to owners and occupants of other cars. A first-party scheme is one in which the owner's or driver's only risk (against which he insures) is that of injury to himself, his car, and its occupants. (Liability to pedestrians might be handled in various ways under either type of scheme.)

24. As to whether such a tax would "really" be "specific" and not "general" deterrence, see p. 665 *infra*.

other way to attack the tertiary-cost problem which doesn't push us in an undesired direction as regards auto design.

More fundamentally, we shall have to consider whether, under any scheme which casts accident cost on cars, insurers will find it worthwhile to categorize, for rate-setting purposes, with reference to the insured car, the insured driver, or both. If, for example, it is so much cheaper or effective for insurers to categorize by driver that drivers will be differentiated but cars lumped together, we might deplore both the injustice (as we see it) to elderly drivers or to households with youthful members, and the externalization of deterrent pressure against unsafe auto design and manufacture. We could respond to the latter problem through specific deterrence; but we might also consider whether both could be handled by forbidding rate differentiation on grounds of age and using specific deterrence to restrict the driving privileges of accident-prone drivers—thereby perhaps making it worthwhile for insurers to introduce rate differentiation according to cars, since worthwhile differentiation by driver would no longer be permitted.

Now obviously a discussion of this kind can be called an "application" (my word, not Calabresi's) only in a rather peculiar, intermediate sense. It takes theory—or, if you will, speculation—expressed at a somewhat remote level of generality and abstraction and "applies" it to a quite concrete and topical problem. Yet the discussion remains theoretical in the sense that it is not *empirical*. There are still no data. We can see that Calabresi's system might assist us greatly, insofar as we can be reasonably sure that insurer behavior (say) will actually correspond to Calabresi's economic model. His suggestion that it will may ring true to our ears; but no factual verification is offered.

My own opinion is that there is precious little cause here for disparagement of Calabresi's achievement, though he has been tasked with failure to provide or pursue empirical verification.²⁵ It is true that some assumption about human behavior will be found at each joint of the conceptual framework—such as that firms try to maximize profits (minimize losses); or that tort liability unaccompanied by economic pain will not deter; or that individuals systematically undervalue the risks of serious bodily injury to themselves. Without such assumptions it would, indeed, be impossible to talk both coherently and conceptually about the accident-cost problem; one's attempt to fashion a coherent conceptual framework would be off in the realm of pure reason. And yet any self-respecting empiricist will tell you that empirical rigor is

25. See Posner, *supra* note 8, at 647.

impossible except in intimate association with hypothetical rigor—or, in other words, that a good, pertinent conceptual framework is indispensable.

But Calabresi does not himself believe that a conceptual framework for further research—a hypothesis generator—is all he has produced. He speaks somewhat ambivalently to the question of using his “applications,” and others which might be derived from his more general arguments, in the absence of empirical validation, but plainly he thinks it a mistake to forbear from evaluation of existing and proposed systems until all the relevant data are in. I find it hard to dispute his claim that it is sometimes wisest to act on impressionistic assumptions—depending on how strong these seem and on how unlikely we are, within a reasonable time, to get anything better. Even readers who balk at that should at least admit that a powerful conceptual engine can usefully be run “in reverse,” so to speak—for example, to demonstrate (as with the “first-party” question briefly discussed above) that proper evaluation of a proposal requires attention to certain factual or valuational issues which have, so far, been insufficiently specified; or to show that a proposal or extant practice logically entails assumptions which so sharply contradict our instincts or impressions as to shed grave doubt on its soundness.²⁶

IV.

Considering how heavily the organization of Calabresi's book is made to depend on the distinction between general and specific deterrence, he is surprisingly, even disconcertingly, diffident in his claims for the ultimate validity of these key concepts—for their capacity to distinguish sharply and dependably among events or situations for prescriptive or deductive purposes. Indeed, Calabresi is content to use them as a mere convenience in organizing discourse—as a compendious descriptive terminology through which he can refer to fluid and overlapping combinations of regulatory techniques (which he calls “approaches”) for purposes of offering two somewhat different, but related sets of generalizations about them. The trouble is that this is too modest a usage for such an imposing locution. Readers generally will find it difficult to avoid over-commitment to Calabresi's descriptive categories; or, putting it differently, will be convinced by his treatment of them that something of fundamental significance must lurk behind them. By not

26. For an illustration, see pp. 678-79 *infra*.

being more explicit than he has been about what that something is, Calabresi allows the usage to be surrounded by an unnecessarily disquieting aura of arbitrariness and vagueness which evokes doubts (I think mistaken) about its utility and "reality."

Understanding would be deepened, I believe, by backing off from Calabresi's characteristic attempt to sub-classify regulatory techniques and "approaches" in terms of his major conceptual distinction, and by focusing instead on distinguishing among the functions or goals of legislative action in the area of controlling accident costs. To articulate this "functional" distinction requires some clarification of the central elements of Calabresi's conceptual scheme.

A "cost" is an adverse impact on a choice-maker. The cost is "monetizable" if it would make sense to the choice-maker to enter into an exchange transaction with regard to that cost—either compensating another to be rid of it, or demanding compensation himself for bearing it. The cost may be non-monetizable either because the costs of arranging the "monetizing" exchange seem to outweigh potential benefits from the exchange (*i.e.*, the cost is small in relation to transaction costs),²⁷ or because it involves "moral" elements for which no satisfactory exchange equivalents can be found. Another characteristic of "moral" costs which may impede exchange transactions in regard to them is that they may bear a non-linear relationship to increments in the volume or rate of the activities which generate them—so that, in extreme instances, a continuous and marginal increment in the generating activity may move us discontinuously from a situation in which the cost is virtually unnoticed to one which presses the outer limits of tolerance.

The choice-maker upon which costs are deemed to impinge can be an individual household or firm, or it can be a group of households and/or firms acting concertedly. Because concerted action very likely entails concession and compromise by members of the group, any cost which is fully monetizable by individuals will probably be valued more accurately through voluntary exchange transactions among individuals than through some more centralized process. There are, however, likely to be some impacts which a group would effectively recognize as costs but which individuals would often fail to monetize. This may occur when the aggregation of severally minute or indeterminate impacts on individual members produces a total cost which seems worth doing

27. For this purpose, at least, we can include in "transaction costs" the costs to the choice-maker of developing information necessary for an accurate valuation of the "primary cost" which, absent such information, remains non-monetizable.

something about by some means available only to the group, or because the group is willing to act in response to violations of its collective morality (*i.e.*, a morality which is prevalent among its members), even though a significant number of individuals would not voluntarily act according to that same moral judgment.

In any case in which a group finds it potentially worthwhile to act in regard to costs which for many individuals will be non-existent or non-monetizable, the group may further conclude that the benefits of appropriate group action will outweigh any undesirable effects of ignoring or overriding individual preferences and cost evaluations. When this conclusion is reached, the group will act.

Groups may be of greater or lesser size, and larger groups may include numbers of smaller groups. Just as given costs may call for a judgment about whether they are more effectively taken into account by individuals or a group, so may there be need for a like judgment as between smaller, less inclusive groups and larger, more inclusive groups. "Decentralization" is preference for cost accounting and avoidance by smaller, less inclusive groups and, ultimately, by individuals.

There are two distinct functions performed by a legislative body when, with a view to optimizing the cost output of some activity, it establishes rules for allocating liabilities and evaluating costs. We can call these "centralizing" and "decentralizing" functions. The centralizing function arises out of the possibility we have discussed that the legislature, or some other relatively inclusive group, will perceive in certain kinds of activities costs which will not otherwise be recognized or monetized either by those who control the means of economically avoiding such costs or by others with whom they transact. The centralizing function, then, consists of coercing potential cost avoiders into acting in accordance with the legislature's, or relatively inclusive group's, perceptions of costliness.

The decentralizing function arises out of the opposite possibility that certain costs can be most accurately valued by the most decentralized set of choice-makers able and motivated to recognize and monetize them; and that sacrifices economically necessary to avoid such costs can be most accurately valued by those who would have to make the sacrifices. The decentralizing function, then, is to provide a framework for voluntary transactions designed to maximize the probabilities that individuals or relatively small groups will be motivated to recognize and monetize costs, with the result that those who could avoid costs with the least sacrifice will be motivated to consider whether the sacrifice is worthwhile.

Viewing the two functions in light of one another, it can be said that the first is what the legislature does insofar as it cannot invent an acceptable way to feed group perceptions of costliness into decision processes more decentralized than those processes which it actually prescribes; while the second is what the legislature does in order to avoid, insofar as possible, having to do the first. By thus describing the two functions circularly in terms of one another, we can see that interpenetration between them is virtually inevitable in any legislative action involving either one.

The centralizing function of course corresponds in a general way to Calabresi's "specific deterrence"; while the decentralizing function generally corresponds to Calabresi's "general deterrence." But the correspondence is general only. Calabresi applies his terms to techniques and approaches, and there is little use in trying to sort these according to function performed because many of them perform both functions in varying degrees. And this is most precisely—indeed, definitionally—true of those complex, "mixed" techniques which most require the kind of clarifying discussion which the Calabresian insights generate—techniques such as licenses, regulatory taxes, restrictions (*e.g.*, against driving without "due care") which are enforced only against those violations which lead to consummated harm, and categorization of activities for purposes of collective liability assignment or cost evaluation.

We can, to be sure, allow ourselves to think about what techniques would be used if only the centralizing function were to be served (because, say, the slightest degree of decentralization was thought to undermine intolerably the collective cost appraisals); or what techniques would be used if only the decentralizing function were to be served (because all collective evaluations were totally mistrusted). We would in short order arrive at Calabresi's "worlds" of "total specific deterrence"²⁸ and "perfect general deterrence,"²⁹ and would spend as little time in these wonderlands as Calabresi does himself. Analytically speaking, every technique or approach which is not of those "pure" worlds, and which is of the real world, is a "mixed system"—not centralizing or "specific deterrence," not decentralizing or "general deterrence," but both.

My criticism is not that Calabresi has failed to understand this, for that—as his own evocation and dismissal of the "pure worlds" exempli-

28. See pp. 111-13.

29. See pp. 88-94.

fies—is plainly not true. Nor do I mean to suggest that the distinction I have proposed with regard to legislative functions has escaped Calabresi, for he has essentially identified the two functions in discussing the respective “bases” of general and specific deterrence.³⁰ What I question, rather, is the decision not to maintain a sharp focus on the functional distinction as the key to a unified discourse on techniques, but instead to undertake a bifurcated discussion which cannot help reinforcing an idea that Calabresi knows is wrong—that some techniques *are* general deterrence while others *are* specific deterrence. Perhaps the best illustration of the confusing and contradictory tendencies of the bifurcated discussion is the treatment of the recurrent issue of case-by-case versus category-by-category decisions regarding either liability assignment or cost evaluation. To discuss these issues repetitively as Calabresi does—first for general deterrence and then for specific deterrence—is a method practically guaranteed to make the reader overlook what surely is the critically important point: that all categorization, all departure from maximum individuation of judgment, is designed to serve the “specific deterrence” function of centralizing the identification and valuation of costs which a less centralized regime will fail to recognize. A continuing, explicit focus on the duality of legislative function would make it possible to speak coherently in different contexts of the same technique—say a tax on heavy cars—as “specific deterrence” *insofar as* the tax is designed to force recognition of a cost which the legislature predicts will otherwise be ignored by that transaction-organizing medium (liability insurance) which is expected to occupy the auto-accident field, but as “general deterrence” *insofar as* one means to emphasize that use of the tax allows a more decentralized type of decision than would be possible under a flat prohibition on use of heavy cars.

There remains something oddly troubling about Calabresi’s choice of terminology. He had available to him (and sometimes uses as a second-string team) the parallel terms “collective” and “market” deterrence. There can be no doubt about which of the latter terms applies to which of the legislative functions. But the assignment of duties to the first stringers is far from obvious. It is true that in reappraising decentralized cost evaluations the legislature must focus on particular cost-creating activities, and in that sense its action is “specific,” as compared with the “generality” of activities and costs covered by rules facilitating decentralized transactions. But in another, and seemingly more pertinent perspective, the appropriate terminology is reversed. Fully centralized

30. See pp. 69-75, 96-107.

cost-reappraisal is meant to apply with like impact to all choice-makers and thus is "general"; while a framework for decentralized transactions is meant to facilitate solutions which are "specific" to particular choice-makers and situations. Calabresi himself has written that "[g]eneral deterrence . . . seeks to value accident costs on as individual a basis as possible"³¹—a statement which the uninitiated might find a rather remarkable use of English.

V.

To illustrate further the clarifying power of Calabresi's theoretical engine (and the import of the preceding discussion), I shall set it to work on a problem which at first glance may appear rather far removed from that of accidents. There is now abroad in the land a lively interest in viewing private lawsuits as an important component of any system of air-pollution control law. More specifically, there is great interest in using privately-initiated nuisance litigation, perhaps with some modification of the common law doctrines, in such a manner. My hypothesis in what follows is that Calabresi's work can greatly assist us in understanding this notion (or family of notions), in uncovering its hidden premises, in evaluating it, in finding a proper niche for nuisance law in a total system and inferring thereby the sounder answers to mooted doctrinal questions, and, conversely, in better understanding observed judicial behavior in nuisance contexts. The discussion may at the same time reveal some possible weaknesses in Calabresi's formulations and arguments, or some limits on his vision imposed by his chosen context of accident costs; in a number of relevant respects the pollution problem is very different from the accident problem and Calabresi's embroidery will, therefore, sometimes have to be stretched to fit the new topic.

It is of the essence of an "accident" that, while the frequency of its occurrence in general form may perhaps be statistically ascertained, its particular incidence is unpredictable. Moreover, as soon as an accident has occurred it is over, and can no longer be prevented. There is, in short, an important sense in which any accident can be called unintentional. This will not, however, be so of a continuing or recurrent discharge of substances into the atmosphere, once someone interprets that discharge as a cause of injury or grievance and chooses to make an issue of it. At that point, a good deal is known about particular inci-

31. P. 95.

dence: the injurer-victim relationship will have a forward extension in time, prevention will still be possible, and a failure to prevent will be intentional. This difference between "accidental" and "intentional" injury will be seen to play an important part in what follows.

A. *Anti-pollution "Myths"*

It is best to begin by noting the obvious application to pollution problems of Calabresi's concern about the already mentioned "myths." Here, if anywhere, it is surely necessary to keep harping on the points that our society is not—cannot sanely be—committed to preserving absolute and pristine environmental "purity" no matter what the cost; that, on the other hand, an industry's ability, even under strict tort liability, to meet all the judgments against it and still make profits does not fully answer the societal question; and that we are not limited to a choice between tolerating pollution and imposing on industry the total costs of prevention and clean-up, because the public can find ways of paying or sharing those costs.

B. *Anti-pollution "Perfect General Deterrence"*

Let us, however, momentarily suspend judgment as to the second myth—that is, assume that individual households and firms can be motivated by a well designed transactional framework to recognize and monetize all pollution costs which ought to be deemed significant by the legislature—and see what Calabresi has to tell us about the design of such a framework. The most obvious form for such "perfect general deterrence" might seem to be the pollution analogue to strict manufacturer's liability—a flat rule of strict emitter liability in "private nuisance" actions. The "cost internalization" rationale for liberalized standing and stricter liability principles in nuisance law is obviously appealing to current commentators³² and one can imagine portions of Calabresi's discussion being invoked as theoretical scaffolding for that rationale. The power and value of Calabresi's treatment can be seen in that it does, at the same time, reveal a need for discriminating use of economic theory by the cost-internalizing school of nuisance-law commentators. The most sweeping arguments for strict liability and liberal "standing" criteria would apparently assume that polluters are nearly always the cheapest cost avoiders, and while that assumption may have

32. See, e.g., Katz, *The Function of Tort Liability in Technology Assessment*, 38 U. CIN. L. REV. 587, 606-22 (1969); McCarthy, *Recent Legal Developments in Environmental Defense*, 19 BUFF. L. REV. 195, 201 (1970).

a certain gross plausibility for the whole universe of pollution-nuisance cases, there is no *a priori* reason for believing it to be valid in any particular case.³³ In a given situation, the cheapest cost-avoiders may be, say, the few residential neighbors who would have to relocate out of a predominantly industrialized area.³⁴ It seems necessary, therefore, to ask whether a more individualized approach to liability assignments would not be worthwhile. The flat rule of strict polluter liability would decide "what-is-a-cost-of-what" on a "category-by-category" rather than a "case-by-case" basis. But it is not true in cases of on-going pollution, as it is in accident cases, that *only* category-by-category decisions are feasible for general deterrence. Because each individual pollution case involves future as well as past harms, useful internalizing can be achieved through case-by-case allocation of liability. In this setting we cannot, as we did when discussing accident cases, dismiss "case-by-case" liability allocation as purely retrospective in import and therefore useless for deterrent purposes (except as statistically extrapolated into categorical form).³⁵

In short, while "internalization" may be a well-stated goal for nuisance law, the question whether that goal implies a general rule of strict polluter liability is not so simple. The alternatives to such a rule are at least two: the first would be a centralizing or specific deterrence principle under which the court in each case imposes or withholds liability according to how it "balances" the "true social costs of the defendant's pollution" against "the cost to the polluter of purchasing control equipment" or going out of business.³⁶ The second would be a decentralizing rule which differs from specific deterrence in that the court imposes liability without deciding whether any given cost-avoidance measure would actually prove worthwhile, but also differs

33. The assumption seems implicit throughout Muskie, *Torts Transportation, and Pollution: Do the Old Shoes Still Fit?*, 7 HARV. J. LEGIS. 477 (1970), as well as in Katz, *supra* note 32, and McCarthy, *supra* note 32. But see Note, *The Cost-Internalization Case for Class Actions*, 21 STAN. L. REV. 383, 391-92 (1969).

34. This possibility is easiest to see on the assumption that the only costs associated with the discharges in question are those sustained in the immediate neighborhood—that there is no dispersion of costly effects to the wider community. But the argument may retain its importance even when that assumption is abandoned. For it may well be true that the only costs which are cognizable and monetizable in a "perfect general deterrence" framework are those sustained in the immediate neighborhood. It may be necessary to rely on far more centralized methods to force polluters to take account of the more broadly dispersed costs; in such a case, if a private nuisance suit has any proper role at all it probably should ignore all but the extremely local, clearly monetizable costs (*i.e.*, those which would be counted in awarding compensatory damages to persons in the immediate vicinity). See pp. 675-77 *infra*.

35. Cf. pp. 656-57 *supra*.

36. See Esposito, *Air and Water Pollution: What to Do While Waiting for Washington*, 5 HARV. CIV. RIGHTS-CIV. LIB. L. REV. 32, 36 (1970).

from the flat rule of strict liability in that liability is shifted only if the court decides *in a given case* that the polluter is more likely than anyone else to be able to avoid pollution costs cheaply, or that placing liability on the polluter's activity is the best way to find the cheapest cost-avoider.³⁷ A liability rule of the latter type would lead to the purest application of Calabresian general deterrence to pollution/nuisance law.

Let us explore it further by considering a hypothetical case involving a smoke-belching factory which imposes substantial pollution costs on the nearby residences. The circumstances, let us assume, are such that the costs could be reduced or avoided by wet scrubbers installed at the factory, or by air-conditioners installed in the homes. If we had a strong suspicion about which cost-avoidance technique were the cheaper, but retained some uncertainty about whether even that technique would produce worthwhile savings, the decentralizing solution would be to impose liability directly on the party thought to have control over the cheaper abatement technique, thereby setting up a market test while avoiding the costs of transactions to locate the cheapest cost avoider. If, however, we were in genuine doubt about the relative cost-effectiveness of the two technologically possible abatement methods, then the goal of facilitating optimal transactions would have us allocate liability initially so as to minimize not abatement costs, but costs of market transactions seeking the cheapest cost avoider; in other words, we should load liability initially on that side (the "best briber") which can most cheaply organize the voluntary transactions necessary to shift it if the initial placement turns out to have been wrong. So argues Calabresi,³⁸ and his argument seems correct as far as it goes. In order to carry it further, however, we shall have to consider choices which face the court concerning not only whether it should grant relief to the complaining homeowner, but also the form of that relief. Inasmuch as pollution is often deliberate, continuous, and territorially confined, it becomes possible at least in principle to use injunctions to help create a market in pollution costs where a market in accident costs is, as we have seen, impossible.³⁹ It might be done, for example, by holding the polluter liable to injunction at the behest of any significantly affected receptor, but allowing for dissolution of the injunction (or waiver of rights to seek its issuance) by agreement of the parties. The

37. See p. 670 *infra*.

38. See pp. 150-52.

39. See p. 658 *supra*.

polluter could then be expected to bargain with receptors for contractual releases of their claims, leading to optimization through market comparison of pollution-avoidance costs at the plant with pollution costs (or avoidance costs) at the homesites or other points of reception.

Yet although this method does at least open up the possibility of a far purer version of market deterrence than seems attainable when dealing with accidents, we must recognize that it may often involve high—perhaps prohibitive—tertiary costs which might be avoided by a retreat from maximum decentralization of cost appraisal; that is, by confining relief to damages. This may be Calabresi's assumption when, straying momentarily off the accident reservation and into the pollution field, he remarks that "it is almost certainly cheaper for the [smoking] factory to bribe homeowners than it is for homeowners to unite to bribe the factory," and that making the factory liable would, therefore, "be justified."⁴⁰ For only on the assumption that liability is restricted to money damages, and will not encompass injunctions, is it at all clear that factories can bribe more cheaply than homeowners can.

In any given situation of this sort, three liability decisions are possible, and we should try to grasp the tertiary costs for each of them. The rules are: (1) the homeowners (victims) are liable;⁴¹ (2) the factory is liable to injunction against pollution at the behest of any homeowner within range; and (3) the factory is liable only to damage judgments. Under either rule (2) or rule (3), adherence to decentralizing principles would require that the factory be free to bargain for releases from homeowners.

Under rule (1) (homeowners liable), there are no litigation costs to impede the mounting of cost pressure (*i.e.*, against the homeowner). Such pressure, however, can be effective in locating the cheapest cost avoider only if the homeowners can organize themselves into a group capable of negotiating with the factory for its commitment to certain abatement procedures; and such organization, as Calabresi notes, may entail prohibitive bargaining costs in identifying members of the interested class, bringing them to agreement on how much to offer and how to divide up the costs, and dealing with free-loaders.⁴² If these costs appear overwhelming in view of any primary pollution cost saving

40. P. 254.

41. "Liable" in the Calabresian sense that they will bear the costs, at least initially.

42. "The free-loader is . . . the person who refuses to join a union because the fact that most other workers are union members assures him of the benefits of unionization without the cost." P. 137 n.4.

which could flow from a factory-homeowner transaction, the result will be "no deal."

Under rule (2) (factory liable to injunctions), litigation costs are involved at the outset. They promise to be relatively low, however, because a single lawsuit by a single plaintiff, involving only the issue of whether the factory is in fact a source of significant pollution, will under this rule suffice to "internalize" all costs to the factory; and indeed, this relatively inexpensive suit will almost certainly be such an obvious and credible threat that the factory will not wait to be sued before opening negotiations with all the homeowners. The costs of these negotiations may be heavy, however, because the factory will have to insist on a package deal involving releases from each one of the potential plaintiffs who singly could have it enjoined; and this, as in case (1), will mean identifying all those persons, getting them to agree on terms, and coping with hold-outs.⁴³ So we again face the real danger of "no deal," with the shoe now on the other foot for no particularly good reason (given our hypothetical inability to say who is the cheapest cost avoider).

Under rule (3) (factory liable to damages but not injunctions), the costs of negotiations would clearly be brought under control. The factory would be faced with the prospect of a periodically recurrent income drain representing damages to be awarded from time to time to each prospective plaintiff.⁴⁴ It should thereby be motivated to consider, with respect to each plaintiff, whether the combined costs of (i) buying that plaintiff an air-conditioner and (ii) either paying that plaintiff's residual damages as they accrue or securing from him a release from such liability, will be more or less than the discounted value of the damages that plaintiff would sustain without an air-conditioner. Of course, there will be some negotiation costs whenever that comparison points towards a transaction; but these will be minor compared with those required under rules (1) and (2) because *group* bargains, with all their special costs, are unnecessary. The factory can optimize by making deals with all prospective plaintiffs who are so situated that an air-conditioner seems worth its costs in pollution abatement, while leaving more marginal victims to their damage remedies.

43. A hold-out is, of course, a free-loader in reverse—the person who won't chip in his release unless he gets the lion's share of the compensation available to the group as a whole.

44. Alternatively, with some saving in litigation costs, lump-sum "permanent damages" might be awarded—a kind of private eminent domain. But this method would sacrifice the continuing deterrent pressures exerted by the prospect of periodically recurrent damage awards. After an award of "permanent damages," the polluter is subject to no further incentive to seek out improved abatement methods.

But there is another side to this picture. Litigation costs may be heavy under rule (3). A plaintiff must show not only that the factory pollutes, but that he is thereby damaged in a specified dollar amount. There will likely be at least some marginal victims for whom these costs are prohibitive in light of the potential recovery—and as to their injuries, at least, externalization will occur.⁴⁵ The situation is complicated by the fact that under this rule what-is-the-cost is decided collectively—very likely meaning that costs which to a “reasonable man” would seem speculative or idiosyncratic, however real and important to the actual victims, may be externalized. This effect may further increase the number of “marginal” victims (and the total magnitude of their externalized injuries) who will not find it worthwhile to sue. It can, moreover, encumber the bargaining process, making it more expensive, because the factory and the homeowners may make different predictions concerning how the collective tribunal will evaluate the non-monetizable costs.

From this discussion the following lessons seem to emerge: (1) In applying a decentralist or transaction-organizing version of nuisance law, the court may decide to shift liability to the polluter either because it believes the polluter is the cheapest cost avoider or because it believes that the polluter is the best briber. If the court acts on the latter ground, it should be wary of negotiable injunctions with their heavy negotiation costs which may prevent the polluter from bribing effectively, and should probably confine relief to damages despite their associated litigation costs and measurement difficulties. But if the court acts on the former ground, it might be favorably disposed toward injunctive relief—partly in the interest of avoiding the heavier litigation costs associated with damage judgments, and partly also because relief in this form allows (indeed entails) some judicious infiltration of “specific deterrence.” Injunctions can and often will be tailored to internalize to their supposedly cheapest avoider costs which it will be difficult to measure in damage judgments;⁴⁶ and even if the court tries to restrain its focus to monetizable pollution costs, the injunction implies at least a tentative substitution of judicial for market judgment on the question of whether these costs are worth bearing for the sake of asso-

45. The problem could be altered, but not eliminated, by allowing non-frivolous plaintiffs to recover their litigation costs—including counsel fees—from defendants. The effect would be to make polluters over-value pollution costs to some extent.

46. That is, the court has to decide just what its decree will prohibit. It might attempt to write a decree prohibiting only the infliction upon persons or property of the kind of harm which supposedly would be compensated by a damage judgment. But the court can, if it sees fit, compose a sterner decree than that.

ciated production. (2) Either way, tertiary costs and/or measurement difficulties seem to raise serious questions about the utility of highly decentralist versions of nuisance litigation as a "cost-internalizing" approach to air-pollution control.

Such skepticism may be reinforced by considering how our various remedial approaches would be adapted to cases involving discharges from multiple sources which cumulate or interact in creating a legally cognizable grievance. We can reasonably insist in such cases that all the contributing polluters be joined as defendants. It is unlikely that any one of them would appear to be *the* cheapest avoider of all or most of the costs; but it might turn out that one would—because, let us imagine, it was the sole source of a catalytic discharge whose suppression would wholly eliminate the problem. It is also possible, though unlikely, that one of the polluting firms could be identified as *the* best briber—because, let us say, of its dominant size and its ownership of a majority of the pollution sources, widely scattered about the problem area. In either of those cases, the court could issue an injunction, or award compensatory damages, against the single firm identified as cheapest cost avoider or best briber.⁴⁷

It seems that in most multiple-source cases a decision to hold polluters liable would reflect a grosser judgment that polluters *as a group* are better cost avoiders or bribers than victims as a group. In such a case, a court bent upon decentralization could either grant a negotiable injunction against all the polluters, leaving it to them to organize themselves for purposes of bargaining collectively with victims for a set of releases; or it could grant such an injunction subject to judicial dissolution upon payment by the group of polluters of a total compensatory damage judgment fixed by the court, with the polluters required to decide among themselves how the burden should be shared.

A lawsuit culminating in either of the foregoing remedies would epitomize the massive, basin-wide, cost-internalizing, transaction-organizing, nuisance class action. It seems that each of these remedies could

47. This is not the only point, though it may be one of the most obvious, where discussion trained on resource-allocation problems may seem grossly insensitive to rather obvious issues of justice. The recurrent issue, of course, is whether and when it can be fair for society pursuing its resource allocation objectives deliberately to redistribute income or wealth away from selected firms or households, no more or less blameworthy than those who stand to benefit from these societal interventions. Practical techniques for avoiding injustice without unduly impeding allocative pursuits might well take the form of schemes, perhaps rather artificial and sophisticated schemes, for compensating those who without distinguishing moral taint are deliberately selected for disproportionately burdensome treatment. The subject deserves detailed attention; some prolegomena can be found in Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundations of "Just Compensation" Law*, 80 HARV. L. REV. 1165 (1967).

well entail prohibitive tertiary costs. This latter possibility should certainly increase our wariness about just how heavily we wish to rely on such a "pure general deterrence" approach to pollution control law—assuming we have not from the outset been utterly disenchanted by the assumption which has governed this whole discussion, that astute placement of liabilities, and deployment of compensatory damage awards and negotiable injunctions, can motivate households and firms to take proper account of all pollution costs worth worrying about.

C. *Centralization of Pollution Cost Control*

The notion of a highly centralized process of pollution-cost optimization seems to involve its own set of heroic assumptions—mostly about the existing state of knowledge regarding (a) how to detect and relevantly quantify emissions of any given pollutant from any given source; (b) how to describe, "model," or predict the process of interaction—as conditioned by air flows, temperature, sunlight, etc.—among all emissions from all interacting sources in a problem-shed; (c) how to predict and value the impacts on health, property, and amenity of the products of that process; and (d) how to predict the cost of the most efficient means of constraining any given emission to a selected volume, rate, or pattern. But if we could assume such knowledge, then the case for centralization would seem amply established by a further undoubted characteristic of the total air-pollution problem: that many of the benefits implied by atmospheric purity are goods not easily monetizable or accounted for in private transactions.⁴⁸ That circumstance at least suggests a need for centralized determination of what total situations should be deemed costly at all. Such a determination might most naturally take the form of ambient air standards for a "problem-shed." That is, we would say collectively that significant costs are being sustained when the standards are exceeded—irrespective of how much monetary loss is demonstrable by an individual, and irrespective of whether any single actor can be blamed. That the costs had been collectively deemed significant would not necessarily show that they were such as to warrant restriction or limitation of any of the activities which jointly "caused" them, nor would resort to the market for an answer to that question necessarily be precluded by the inability

48. Among these goods we should probably include not only such obvious ones as blue sky, clean-smelling air, and satisfaction in keeping things more or less as nature provided, but also the avoidance of such damage to personal health as might otherwise be accumulating in increments too small for any victim to notice or take account of in voluntary transactions. Significant involvement of non-monetizable costs is cited by Calabresi as a leading reason for resort to specific deterrence. See Pp. 97-100.

of individuals to monetize these costs. Instead of nuisance suits, in which cost valuations are made on a case-by-case basis and so are fixated on more or less traumatic impacts on determinate persons or property, we could have a modified type of decentralization in which both liability assignments and cost valuations were made categorically, rather than case by case. This might be a system of emission charges so calibrated as to approximate some or all of the external costs of the class and rate of emissions in question.⁴⁹

But even this much decentralization may be hard to maintain. A pollution problem often emerges from accumulation and/or interaction of emissions from several unrelated sources, and can be efficiently controlled only by a set of penally-sanctioned emission standards assigning specific "quotas" to the various polluters in the picture.⁵⁰ This sort of one-fell-swoop, collective cost-benefit decision and allocation of the cost among polluters would reflect the cumulative and "synergistic" attributes of the total problem. Where much depends on thresholds, margins, cumulations, and interactions, the size of any one activity's costs depends heavily on what other activities are up to; and there may be no way, without highly structured collective action, of bringing home to each activity some determinate and appropriate share of the total cost.⁵¹ Whether producer *A* may emit particulates may depend on whether some other producer within some given air-current distance is emitting gaseous pollutants; whether producer *B* may emit a little sulphur dioxide depends on who else in the vicinity is emitting how much; and so forth. It may be that the necessary collective decision-making can be internally structured so as to simulate a market to some limited extent; but collective the decision would remain.⁵²

D. *Coexistence of Centralized and Decentralized Subsystems*

The question of whether private nuisance suits, governed by decentralizing principles as discussed above, should coexist with an emission-fee system turns on what costs or types of costs were considered in

49. Compare Calabresi's discussion of the "limitation" technique at pp. 114-19.

50. Such quotas might be laid on directly, or might conceivably be the result of bargaining within a basin-wide collective control system whereby each polluter's quota is determined by how much he is willing to pay in return.

51. See Roberts, *River Basin Authorities: A National Solution to Water Pollution*, 83 HARV. L. REV. 1527, 1554 (1970). The situation may be such that "any rule that requires all plants to cut back their pollution by a specified percentage or to provide a specified level of treatment is bound to be very inefficient." *Id.* at 1543.

52. This case seems related to the class, described by Calabresi at p. 178, in which "a difficult (and therefore expensive) decision [about whom to regulate] under general deterrence guidelines may be easy [easier, anyway] if specific deterrence criteria are considered as well."

setting the fees. If the fees purported to reflect all costs to society of which emitters in the affected class were deemed to be the cheapest avoiders, to saddle the fee-payers with additional compensatory damage liabilities would in principle cause a misallocation by making polluters pay twice for the same costs. However, in light of the extent to which proper pollution cost-accounting may depend on particular local situations, a broad-category emission-fee system might well be designed to cover only that irreducible minimum of costs which particular discharges were deemed to cause irrespective of any special factors in the local situation. In that case, any partial "double-payment" which imposition of nuisance judgments would cause might lead to less misallocation than entirely foregoing the nuisance judgment's capacity to bring special local costs to bear on their cheapest avoiders. Double payment could be avoided by reducing compensatory-damage awards by the amount of emission fees paid or to be paid; or by making plaintiffs reimburse defendants in this amount as the price of receiving an injunction.

If we assume a more drastic form of centralization, assigning fixed quotas to each polluter in an airshed, is there then any role for transaction-organizing private lawsuits? We should first note that even if nuisance doctrine simply disappeared from the air pollution field, some minor amount of "general deterrence" would probably continue to occur through voluntary transactions between emitters and receptors, insofar as the collective controls left any room for private choice. And so the question must be faced whether it would be worthwhile to try to structure these transactions, and their deterrent consequences, through legal rules for shifting liabilities and assessing costs.

Three possibilities may be considered: (1) nuisance suits might be allowed only for *activities conforming to* the collective controls; (2) nuisance suits might be allowed only for *activities which violate* the collective controls; (3) nuisance suits might be allowed *irrespective of whether activity violates* the collective controls.

As for the first possibility, if measurable injury were demonstrably caused by activity which conformed to a comprehensive set of centralized regulations, the problem might seem to be one which was not thought relatively big or general enough to receive attention in a basin-wide scheme of regulation, most likely because it affected only a few persons. Under these circumstances, private suits might be relatively unimportant but still worth their tertiary costs for their service in backstopping or filling in the specific-deterrence scheme. They might also provide a guidance function, bringing to our attention that the

collective controls are generally weaker than they "ought" to be.

But there are possible counter-arguments. The very reasons that certain pollution costs might have been ignored by a comprehensive regulatory scheme—i.e., because they affect injuriously only a few activities in the immediate vicinity—also suggest that the victims themselves might be the cheapest cost-avoiders or, if they are not, that the appropriate shifting can occur through the market.⁵³ Moreover, it is perfectly possible under centralization that the regulatory scheme has been deliberately calibrated to allow some polluters to inflict some harm on some neighbors. If that is so, then allowing market deterrence of these emissions—either by legal shifting of liability through nuisance doctrine or by contractual shifting through bribes of polluters by neighbors—will undercut the premises of the regulatory scheme (for example, that the neighbors are the best cost avoiders). It at least seems that a court in any private nuisance suit ought to consider whether—in light of the history and evident premises (assuming there are some) of any collective regulatory system—such substantive pre-emption should apply.⁵⁴

Whether or not substantive pre-emption is deemed applicable, the question of procedural pre-emption remains. Suppose we conclude that nuisance suits should be precluded as long as activity conforms to collective regulations. The further argument for disallowing nuisance suits as to activity *violating* the regulations is that otherwise we would have wasteful overlap, and perhaps interference between private and public enforcement.

It is fair to rejoin at this point that the private suit might serve to fill an enforcement gap left by laggard public officials; but we should note that the argument here takes leave of any notion that private litigation is important for transaction-facilitating purposes. Private suits maintainable only against activity which violates collective regulations are nothing but a means for enforcing resource-allocation decisions made entirely outside any private-law framework and entirely without participation by judges or litigants; "private attorney general" is, indeed, the paradoxically apt locution. The necessarily appropriate remedy is a non-negotiable injunction against further violation of the collective

53. Cf. pp. 223-24, and p. 668 *supra*.

54. This assumes that we trust the regulators to do their jobs properly, and so have in mind only a residual function for private litigation. If, on the other hand, we assume that regulators are not to be trusted and that our main reliance should be placed on the courts, then no forbearance by regulators, no matter how deliberate, should preclude judicial shifting of liability. But the court would then be playing a "specific deterrence," not a "general deterrence," role. See pp. 678, 679-80 *infra*.

controls. Damages, if awarded on top of such an injunction, serve no cost-internalizing or resource-allocating purpose.⁵⁵ They may be appropriate for reasons of compensation or incentive (to undertake enforcement), but they have nothing directly to do with inducing optimal decisions about resource use.

It appears, then, that private lawsuits might play a useful interstitial or guidance role in cases where collective-deterrence standards have left an obvious cost unaccounted for; and that they might substitute for derelict officialdom in the enforcement of collective standards. But if these uses exhaust the list (in a world being taken over by comprehensive regulatory schemes), then perhaps a serious question exists about whether nuisance law really deserves all the attention it is currently receiving.

Some may feel that I have dismissed too casually the possible utility of compensatory damages as an adjunct to collective-deterrence standards. Would it not, they might ask, be an ideal marriage to let the standards be fashioned collectively, and then let *enforcement* proceed exclusively through private suits—including massive class actions—leading to compensatory damage remedies? Wouldn't such damages be the ideal means of "internalizing" the costs of violating those controls collectively deemed desirable? Calabresi provides reasons for believing that the answer is no.⁵⁶ He gives them in the context of explaining the irrationality of the "fault" system of automobile liability if regarded as a device for primary-cost optimization. Reworking his arguments to fit our context, we would note that the legislature has, presumably, resorted to centralized dictation of performance standards because of its awareness of certain costs which it believes would go unnoticed in a more decentralized choice system. Since there is no apparent reason why the legislature would want to disregard costs which individuals would monetize, it must be true that the total costs which the central regulations mean to "internalize" to polluters exceed those which would be reflected in compensatory damage judgments fully covering all emissions (as under the "strict polluter liability" rule). But the error which the legislature evidently believes would arise from reliance on strict polluter liability is, obviously, *compounded* if recovery is limited to damages caused by activities violating centrally dictated standards and

55. They may serve a "deterrent" function in the "specific deterrence" sense in which the prospect of penal fines and jail sentences is supposed to "deter." But that suggests completely different criteria for determining the amount of the award than those indicated by either an internalization or a compensation objective. See also pp. 679-80 *infra*.

56. See p. 276.

no other enforcement is undertaken. If, on the other hand, enforcement is forthcoming in the form which seems most appropriate to the premises underlying central dictation—that is, injunctions or effective *in terrorem* punishments—compensatory damages are quite superfluous as regards any “internalization” objective. The “ideal marriage” can begin to make sense only where the sanctions for violation are restricted to financial penalties of a size so moderate as to indicate that they were not meant to function *in terrorem*, and then only by imputing to the legislature a design so extremely sophisticated as to strain credulity, namely: (a) a decision that emissions not in excess of the centrally dictated standards involve no costs worth bothering with, and (b) a decision to divide the burden of internalizing the costs of excess emissions by (i) setting financial penalties designed to cover their non-monetizable costs while (ii) leaving their monetizable costs to be internalized by compensatory damages.

The strain on credulity is enhanced by some further considerations: to fit the logic of this scheme damage recoveries would have to be limited to compensation not for total monetizable costs inflicted by the unauthorized activity, but for the marginal monetizable costs caused by the excess of actual emissions over permitted emissions; and it seems unlikely that litigation could often yield a satisfactorily precise estimate of this figure. Given this inevitable crudity in the cost estimates we can expect from litigation, it is hard to see why a legislature should be supposed to have hit upon this particular division of labor.⁵⁷

There remains at least one other possible ground for believing that private lawsuits should have an important role in an anti-pollution program, even conceding (for the reasons and on the assumptions stated earlier),⁵⁸ that the laboring oar must be left to rather highly centralized cost appraisals. Skepticism about officialdom’s will and capacity may apply not only to enforcement but also to standard-setting. One might believe that a “truer” or more optimal solution is likely to come out of “specific deterrence” organized by class suitors, courts, and polluters in the context of massive nuisance class actions than out of the administrative methods presently being charted for us—somewhat haphazardly—by federal and state legislators.

Any suggestion that nuisance law should be reconstructed into a kind

57. It may be noted that neither of Calabresi’s two conditions (see p. 120) for using specific deterrence “on an involvement basis” is satisfied. It is not the case either that the collectively disfavored conduct defies adequate definition outside of an actual involvement context, or that violations are undetectable except where there has been some traumatic “involvement.”

58. See pp. 674-75 *supra*.

of judicially administered specific-deterrence system—that it should become *the* engine of collective cost appraisal—carries some implications worth noting. The first and most important is that such an attribution of purpose to nuisance law seems to argue not for any move towards the transaction-facilitation notions of “strict liability,” but rather for retention of something very like the “reasonableness” principle, under which liability is shifted to the polluter only if the court concludes that the costs inflicted by given emissions exceed the costs of their abatement.⁵⁹ In the context of a basin-wide class action, this might entail a step-wise process in which the court (presumably through expert testimony) tried to identify the optimal abatement scheme⁶⁰ and then balanced its cost (including “opportunity” costs) against pollution costs thereby saved, basing its liability-placing decision on the outcome of that balancing. The appropriate remedy would, apparently, be a non-negotiable injunction against any emissions in excess of ceilings established as part of the optimal scheme.⁶¹ It should be noted that this outcome may well be different from that reached under a transaction-facilitating version of nuisance law;⁶² for, although a specific-deterrence decision to enjoin polluters certainly entails a decision that they are the cheapest⁶³ cost avoiders, a court using general deterrence principles would not upon reaching such a conclusion dictate an abatement program, but rather would simply award damages, or else enjoin all further pollution subject to the acquisition of releases.

The kind of judicial role we are now envisioning provides a special opportunity to test the unraveling power of Calabresi's tools, inasmuch as it throws into the sharpest possible relief one of the knottiest problems of traditional nuisance law—that of how a court should respond to the likelihood that its injunction, if granted, will force an enterprise out of business and thereby spark some severe (even if theoretically short-run) local economic troubles.

59. See RESTATEMENT OF TORTS §§ 822, 826, 827 (1939).

60. To do this properly may require some decidedly “unjudicial” involvement on the court's part, because in all probability the issue is not a matter of two simple alternatives. The optimum probably lies somewhere along a non-linear series of technological possibilities between zero-abatement/maximum-pollution and total-abatement/zero pollution. See FULLER, *Collective Bargaining and the Arbitrator* in COLLECTIVE BARGAINING AND THE ARBITRATOR'S ROLE 8 (M. Kahn ed. 1962).

61. Since the collective-deterrence decision to hold the polluters liable already incorporates an overarching cost-benefit judgment, it would seem wrong to incur the heavy tertiary costs likely to be associated with prospective damage remedies in the context of a basin-wide case.

62. See pp. 672-73 *supra*.

63. Or that they are the “best” cost avoiders; see p. 175.

Up to this point, our discussion of pollution control has not touched on secondary costs; and the problem of secondary costs—in the simple and direct sense of avoidable loss from cumulation of costs on one person at one moment in time—does indeed seem *prima facie* less significant in a pollution context than when dealing with accidents. The concept of “pollution” itself implies that primary costs in their initial incidence are already spread rather widely among victims. While there are, of course, some exceptional cases which would belie this statement, the fact remains that the suddenness, immensity, and crisis which are somewhat characteristic of accidents, and tend to imbue them with significant secondary costs, are not very typical of nuisance/pollution cases. While avoidance of secondary costs through spreading plausibly seems to some observers a prime goal of accident-cost compensation systems,⁶⁴ it can safely be said that the reasons for social intervention to shift pollution or nuisance costs away from victims and onto enterprises lie almost completely in spheres other than secondary-cost avoidance.

In fact, it is the shifting which is most likely to precipitate (rather than disperse) crushing cost accumulations; and it is at the point of shifting that the spectre of secondary costs can be seen to play a major complicating role in the design of anti-pollution programs, particularly in that “program” which consists of private nuisance law. Calabresi’s intimation of an endemic conflict between primary and secondary cost avoidance is thus vindicated. For concern about secondary costs may well lie at the root of the common judicial timidity about whether major industrial (or municipal) polluters should be held liable at all and about whether, if so, injunctive as well as monetary remedies should be granted.

It may not be immediately evident that secondary costs are playing a role here. For judicial indulgence in such “utility balancing” could be thought justified by the aim of primary-cost avoidance, insofar as reduction of enterprise output is recognized as a cost which must be traded off against whatever gains will accrue from restrictions, and insofar as the variables which courts purport to notice—such as payroll size and value of industrial plant—are valid surrogates for the community’s evaluation of the product. Yet, as we have seen, these considerations may be inconclusive as long as concern is restricted to primary-cost optimization, because it may be unclear whether that goal is not best achieved by shifting legal liability to the polluter, leaving him to buy his way out if

64. See, e.g., W. SEAVEY, P. KEETON & R. KEETON, *LAW OF TORTS* 220 (Supp. 1970).

he can "afford" to.⁶⁵ But suppose there is fear about secondary costs—costs in human demoralization, wasted plant, community disintegration, or social unrest which will not accrue at all unless primary-cost liability is shifted to the enterprise. It will then be at least possible that, while the value of the enterprise's products and services will by itself be too low to cover the pollution cost being shifted onto it (with the designed result that the enterprise will cease), the total of this value plus the secondary costs which it is feared cessation would cause exceeds the benefits of pollution abatement. On these assumptions, a shift of liability to the enterprise could seem inclined towards market determinations which are, at least for the short term, socially sub-optimal. The enterprise, in deciding whether it was productive enough to cover the newly shouldered pollution cost and still be worthwhile, presumably would not weigh any secondary-cost savings on the side of staying in business (that is, the secondary costs would be externalized), because it would have no way of recouping these costs from its customers through the market. The secondary cost-savings would not represent service or product value for which consumers will pay. They would represent a cost which could be avoided by declining to shift liability, and therefore would seem a necessary offset against whatever primary-cost savings shifting might bring about. Where a court is the tribunal appointed to decide whether to decree shifting, there seems no avoiding judicial consideration (no matter how inarticulate) of such costs.⁶⁶ Thus it appears that awareness of the secondary-cost problem may help explain—more convincingly than a simple concern for primary-cost optimization—judicial refusal to disregard economic dislocation as a relevant factor in nuisance cases.

But it does not follow that we should rest satisfied with this sort of judicial behavior, especially if we take a long-term view. To stop here would be to succumb to Calabresi's myth of the "necessary financial

65. See pp. 672-73 *supra*. See also *Boomer v. Atlantic Cement Co.*, 26 N.Y.2d 219, 257 N.E.2d 870, 309 N.Y.S.2d 312 (1970).

66. One can at least speculate about the possibility that these costs could be weighed in an expanded market process which would operate in the wake of an "internalizing" judicial injunction, granted as soon as it appeared that the enterprise was a substantial pollution source. The enterprise would continue to function only if releases could be secured from all persons having standing to secure and enforce the injunctive remedy. The total price of these releases would be at least equal to the combined costs suffered by these persons. The problematical case is one where the enterprise itself would not find it worthwhile to pay so large a price, but the difference between this price and what the enterprise would pay is exceeded by secondary costs which would accrue to employees, individual investors, and governments if the enterprise decided not to pay. Might we then expect these other groups and agencies to chip in with the enterprise to buy releases from the prospective plaintiffs? It seems likely that the costs of organizing any such complex transaction would be prohibitive. See pp. 670-73 *supra*.

link" between injurers and victims. For it seems likely that this secondary-cost problem can be greatly alleviated by governmental spreading, without serious detriment to the deterrence needed for primary-cost control. Suppose that federal and state governments were to declare themselves ready, through various programs and devices (perhaps including unemployment compensation, job-retraining and relocation payment, lump-sum "severance pay" to stricken owners, and emergency aid to stricken local governments) to compensate sufficiently to minimize secondary costs resulting from any business shut-down caused by uncompromising use of nuisance law in the pursuit of primary-cost optimization. Such a promise of succor would not impede the deterrent effects of nuisance doctrine if the court were engaged in "specific deterrence" and therefore issuing non-negotiable injunctions. Even in a "general-deterrence" (strict liability) version of nuisance law, using negotiable injunctions or damages to force a "proper" market judgment, it seems unlikely that the prospect of governmental relief in case of shut-down would cause much externalization. The goal is to make the firm decide whether its operation is worth continuing if required to cover all of its associated pollution costs; if the decision must be that termination is the cheapest solution, it is hard to see how a prospect that government will cushion the blow (mainly the blow to others) will unduly bias owners or managers towards such a naturally repugnant conclusion.

VI.

I suggested earlier that if we are to regard nuisance suits as a vehicle of "specific deterrence," the appropriate standard for emitter liability should be whether there exists some possible alteration of emitter conduct whose pollution-cost savings would exceed its costs. As elaborated above, that suggestion embodies the same questionable assumptions about presently available information and technology which also governed the preceding discussion of a centralized, administered cost-appraisal system. Some close students of the problem believe that relevant knowledge is presently too sparse and primitive to support accurate and dependable administration of a finely calibrated, coordinated, basin-wide quota or fee system.⁶⁷ One ought, therefore, at least to wonder whether a Calabresian analysis can help us find the most rational way to proceed in the face of such a knowledge gap.

67. See J. ESPOSITO, *supra* note 8, at 174-81.

Tentatively, I believe that it can. The basic intellectual operation required is to find a way of viewing the knowledge gap in "cost" terms. By this I don't mean simply an arbitrary (or sophisticated) assignment of a dollar-cost figure to "unknown" consequences of pollutant discharges, but a recognition that ignorance (or uncertainty) may itself be costly no matter what the truth eventually turns out to be.

Indications are that large numbers of people are specially sensitive to and disturbed by suspected but undetermined environmental hazards. Insofar as this is so, it would seem that the uneasy condition of suspicion accompanied by uncertainty should itself be counted a primary cost of pollution. As with any other suggestion about possible costs, this one would present a legislature with the necessity to consider how a set of decentralized transactions might best be ordered so as recognize, monetize, and find the cheapest way to avoid any such "uncertainty costs" as are believed to deserve recognition; and, on the other hand, how far and by what means the identification and evaluation of such costs must be centrally taken over to assure that they can be appropriately counted and avoided without undue tertiary costs.

Such an approach will, I believe, greatly assist efforts to analyze, appraise, and perhaps improve some of the more extreme-sounding current proposals for anti-pollution rules—such as that all pollution should be stopped, or all polluters required to use the most potent known abatement technology, irrespective of how the measurable costs of compliance compare with those of non-compliance. Proponents of such rules might, to be sure, believe that if the costs of pollution were fully known and properly measured (and if measurement of compliance costs were purged of self-serving alarmism), pollution costs would in most or all cases be seen to exceed compliance costs. Observers who find such predictions outlandish or wildly speculative may find it more satisfying to understand these rules as reflecting a feeling that uncertainty costs should themselves be weighed heavily in favor of pollution abatement.

Uncertainty costs imply their own special and related set of abatement costs—that is, the costs of overcoming the ignorance which grounds the uncertainty. Calabresi's first myth applies here as elsewhere: the costs of overcoming ignorance may or may not be worth their combined benefits in dispelling uncertainty and improving cost-benefit analysis of the underlying pollution-versus-abatement problem. But recognition that uncertainty is independently costly, and that information development is the way to avoid its costs, suggests that rules regarding pollution control should (among other objectives) seek to

maximize the probabilities that uncertainty costs will be brought to bear against those who could most cheaply avoid them by developing the responsive information.

Proposed rules such as “zero pollution” and “maximum feasible abatement” seem to make the most sense if understood as legislative attempts to assign a value to uncertainty costs and internalize them to their cheapest avoiders. So understood, I believe, the rules will appear to be not wildly irrational but significantly flawed. Among other defects, they seem to assume that polluters are the cheapest developers of all relevant information. That seems likely to be true of some information—particularly regarding potential abatement technology which is specific to a polluter’s own activity. But as to other information—for example, regarding atmospheric chemistry, or long-term health consequences of various atmospheric conditions, or potential “abatement” through community land-use planning—polluters seem unlikely to be the cheapest developers when compared with other candidates such as specialized scientific research institutes and local or regional agencies, whose efforts are appropriately supported by public funds.

A sound Calabresian attack on this complex problem might begin by including subordinate public agencies—such as municipal governments—along with private firms among the group of decentralized choice-makers to be “deterred” and incited by carefully sculpted liability rules. For starters, one might consider the deterrent and incentive effects of the following regime (to be established by state general law):

A state agency would maintain a list of substances known or suspected to be harmful to health or environmental quality when present in the atmosphere in amounts likely to be encountered, in some places at some times, if legal controls are non-existent. Any citizen would be entitled to sue for an injunction against any detectable emission of a listed substance not authorized by a permit issued by a politically responsible local (or regional) government agency. Any citizen would further be entitled to judicial review and invalidation of a permit, unless the evidence showed convincingly that the suspected harms (which underlie the listing of the substance in question) would not accrue under the permit except in limited magnitudes outweighed by the productive potential thereby released. The local agency would be empowered to levy general taxes to support anti-pollution administration, research, relocation and compensation of families and enterprises disturbed by measures designed to minimize harms from the granting of permits, and regulation of future growth for the purpose of minimizing pollution costs. The agency would also be empowered to impose

emission fees according to a general schedule, or to charge a negotiated price or special emission-fee schedule in return for any permit—the proceeds in either case to be available only for purposes of pollution abatement and related research, relocation, planning, and administration.

Consideration and further pursuit of such possibilities seem worthwhile. It might, indeed, be a task worthy of the maestro himself.